Construction noise and vibration Community engagement

CASE STUDY

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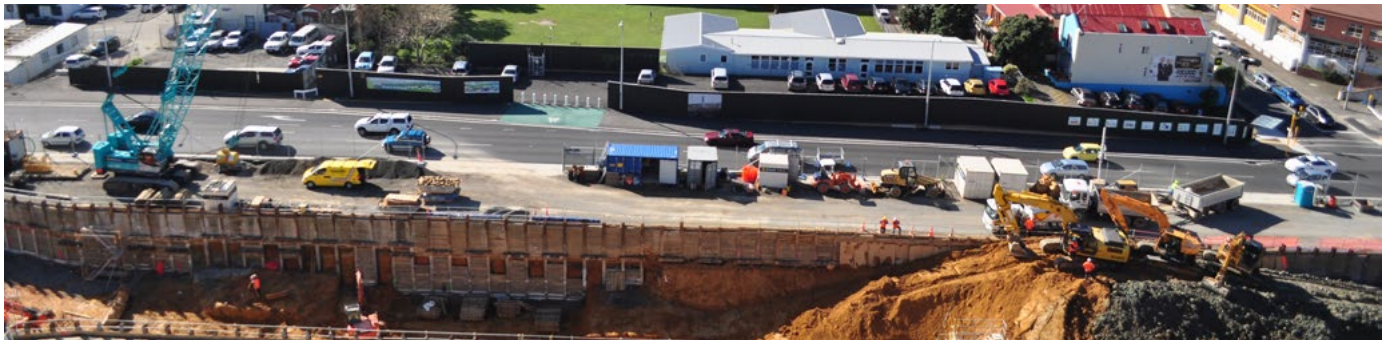

ARRAS TUNNEL

The new National War Memorial Park in Wellington is a key project to commemorate the Centenary of the First World War and the centrepiece of the Anzac Day commemorations in April 2015. Special legislation was passed in 2012 to allow the NZ Transport Agency to put State Highway 1 underground and complete the park on top of the new tunnel in time for the commemorations. The Memorial Park Alliance was formed to carry out the works and comprises the NZ Transport Agency, Downer, HEB Construction, Tonkin & Taylor and URS.

At an early stage, the Alliance set up a charter to achieve excellence in five key result areas, one of which was that stakeholders should have trust and confidence in the Alliance. This was to be achieved by communicating and listening to neighbours and stakeholders, and reacting to criticisms as well as positive comments. Examples of the way these relationships contributed to the Alliance's management of construction noise and vibration are described in this case study.

The project's 'Stakeholder and communications plan' set out the liaison objectives and where relevant these were implemented through the construction noise and vibration management plan (CNVMP) and associated schedules. The Alliance put a particular emphasis on all staff working on the project taking personal ownership of community relations.

Neighbours affected on a daily basis by the project included schools (in particular Mt Cook School); businesses (the nearest being the occupants of the historic Mt Cook Police Barracks), a museum archive and residential properties.

Direct engagement with the project's neighbours regarding construction noise and vibration was carried out through forums, meetings, project updates and newsletters, with written documentation delivered by email and hand. In particular, meetings were held with the projects' neighbours at the start of the project to describe how the noise and vibration effects were going to be managed and to find out any specific concerns. Feedback from these meetings was reflected in the management plans for the project.

All of the project documentation is available on the *project website*.

Concrete-breaking trial

An example of the stakeholder engagement process was to address the concerns from staff of the Te Papa Archives about potential effects from vibration on fragile items stored in their building. This concern was raised during an initial meeting, with particular focus on the first significant activity of the project: the concrete-breaking to remove an existing surface immediately adjacent to the building.

In order to address these concerns, vibration measurements were undertaken by the Alliance at the start of the activity, re-assuring the Te Papa staff that no damage would occur. However, as noise from this activity was causing a disturbance to the staff, the Alliance and Te Papa agreed on measures to minimise this effect. These included the timing of this activity by the Alliance and Te Papa staff working in other parts of their building during this activity.

MOUNT COOK SCHOOL

Located immediately adjacent to the interim road and the tunnel construction site, the school was one of the closest noise and vibration sensitive receivers to the project. A temporary noise wall was constructed between the interim road and the school, as well as extending to the adjacent apartments on Tory Street, to reduce the noise in the classrooms from the traffic on the interim road and from the construction works. As well as providing a noise reduction, the wall became a gallery to exhibit artwork from the school and Alliance progress posters. A booklet entitled *Right beside our school* was written by the Alliance describing the project, including the reason behind the noise wall.

Visits were made to the school by Alliance engineers, site workers and office-based staff, who mentored children's projects and participated in reading during Book Week. Pupils and staff of the school visited the construction site, accompanied by site engineers, to learn about the project. The good relationship and regular communications with the school were important elements in managing construction noise and vibration.

As with the project's other neighbours, an initial meeting was arranged to describe the management of the construction noise and vibration, and to ascertain the school's particular concerns. Regular noise and vibration monitoring was undertaken at the school, together with specific monitoring when significant construction activities were occurring nearby. The Alliance reacted to the effects on the staff and pupils and where necessary re-scheduled activities such as piling and vibratory rolling to reduce the impact on teaching during the core learning periods.

LESSONS LEARNT

- The project had a number of close neighbours with varying occupancies: school, residential, business and museum archive. Therefore the construction noise and vibration management and liaison methods with these neighbours needed to be tailored to each stakeholder. Meetings at the start of the project enabled individual requirements to be ascertained.
- The control of noise from impact piling is difficult and in some instances it may be the case that the only practical mitigation is to operate during less sensitive times of the day. Where possible and practicable, alternative piling methods should be used.
- Personal ownership of community relations by all staff working on the project increases the effectiveness of stakeholder engagement as a key part of construction noise and vibration management.

PILING WORKS

During the course of sheet piling work in the southern retaining wall of the tunnel, unanticipated ground conditions required the method of installation to be changed from vibratory to impact. In doing this, the noise and vibration levels increased at neighbouring buildings. Members of the Alliance experienced the effects inside the buildings and monitoring confirmed that the noise and vibration criteria were being exceeded. At this point, work on this the activity was stopped whilst alternative techniques were investigated and trialled. These included: increasing the amount of pre-drilling; reducing the pile lengths; screening the impact head; covering the piles to reduce the radiation of noise and using alternative dollies between the hammer and the piles. Of these options, pre-drilling of the pile holes was the most promising although there were concerns about the integrity of the completed wall. However the Alliance was committed to finding an acceptable solution and, following further specialist investigations, pre-drilling was used to the satisfaction of all involved.

If you require any additional information, please contact:

Dr Stephen Chiles
Principal Environmental Specialist
NZ Transport Agency
environment@nzta.govt.nz